

# OPPORTUNITIES FOR NEW AND MODIFIED FIBRES IN GARMENT FABRICS

This paper examines the role of new and modified fibres in garment and garment fabrics from a viewpoint which is informed by many years of experience in these downstream markets. This experience has included working for retailers, garment makers, fabric producers and fibre companies, all of which are interested in understanding their end-use markets and their place in the supply chains leading up to them in order to maximize their sales and profits.

The paper starts by describing some of the important structural and dynamic features of garment markets and highlights the key role of fabrics—and therefore fibres—in innovation. The role of new fibres is discussed in more detail to give insights intended to help fibre producers to plan and implement development programs for new and modified fibres. Some methods for assessing the likely commercial viability of new fibres are presented briefly and reference is made to articles which describe them in more detail. The focus throughout will be on added-value fibres rather than commodities.

*By David Rigby*

## GARMENT MARKETS

The following aspects of garment markets are important considerations in this discussion.

- They are heavily influenced by seasonal changes in weather and fashion: product ranges change at least twice and as many as ten times each year.
- They are controlled by retailers acting as proxies for the end-user. Retailers impose a price point structure on their ranges to simplify both consumer choice and their ranging and buying procedures. This imposes price points on fabrics.
- Constant innovation is required, which can come from changes in garment styling and colour and the fabric from which it is made.

## THE ROLE OF FABRIC

Of these sources of innovation, fabric is the most important since colour and styling can be changed on a shorter time-scale. There is an international system for reducing variety and risk in the garment supply chain by agreeing on colour palettes, styling trends and fabric types on which the industry should focus for a target future season. These areas of consensus are worked on by yarn and fabric producers who show their interpretations in product form at the many international yarn and fabric fairs. The broad areas within which fabric innovations can be made are *aesthetics* (handle, drape, lustre, softness, weight, patterning, etc.) and *performance* (easy-care, stretch, waterproofness, shape retention, hard-wearing, etc.).

## SOURCES OF FABRIC INNOVATION

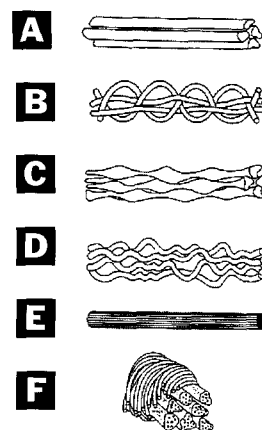
In fibre terms, fabric innovation can come from a number of sources: fibres can be modified in their denier, cross-sectional shape and surface reflectance; new fibre blends such as the recently introduced cashmere/Lycra® can be synergistic; fibres such as lyocell and elastane can produce totally new fabric effects; the Japanese fibre companies have concentrated in recent years in shin-gosen polyesters, which are composite yarns having at least two novel features, of which microfibre is often one. Some examples of shin-gosen fibres are shown in Exhibit 1.

Fabric innovation also comes from the way that fibres are further processed, including:

- spinning and weaving methods (singles worsted yarns, for example)
- wet finishing (caustic reduction, bio-stoning of denim, resin treatments)
- dry finishing (peachskin effects, high lustre by calendaring)
- garment finishing (non-iron cotton shirts).

## EXHIBIT 1

### SHIN-GOSEN FIBRES

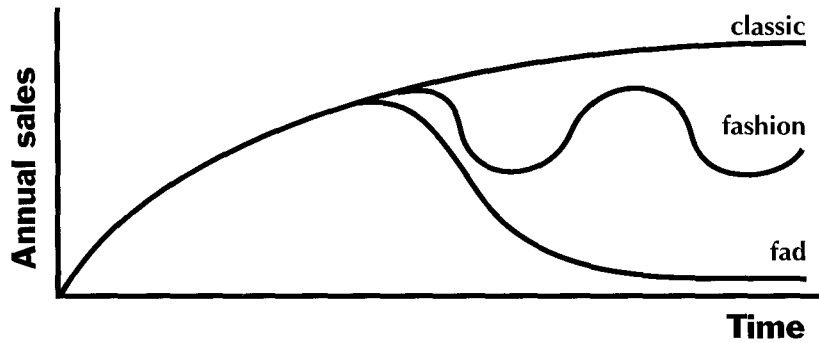


- A) Modified cross-section yarn
- B) Differently shrinkable combined yarn
- C) Thick & thin yarn
- D) Microcrimpable composite yarn
- E) Super high - multi yarn
- F) Multi-layered composite yarn

## SECTION TECHNIQUE TECHNICAL SECTION

### EXHIBIT 2

#### FIBRE AND FABRIC TYPES



Specially developed wet and dry finishing treatments are increasingly an essential and integral part of producing fabric innovation from a new fibre. For example, the full potential of most shin-gosen and lyocell fibres are revealed only by the fabric finishing process.

#### FABRIC STORIES

This is a most important concept in the garment fabric market. A 'fabric story' is a fundamental fabric type which may, however, vary in its implementation in terms of fibres in any one season. Examples are: soft denim, silk-look, jersey-knit. Linen-look is another, and in one of our studies when linen-look was in

fashion, we found six pairs of linen-look ladies' trousers in the same shop, at the same price point, all made from different fibres or fibre mixes, only one of which was 100-per-cent linen. This shows how fibres have to follow the prevailing fashions and why versatility is an important attribute.

#### BASIC QUESTIONS ABOUT NEW FIBRES

In considering the possible market potential for a new or modified fibre, the following basic questions need to be answered:

- Does the fibre produce a unique effect in garment fabric form? If it does, in what product/market segment is this effect of the most value?

- If it does not, what fabric stories will it compete in and against which incumbent fibres? Will this be in 100-per-cent form or mixed with other fibres?
- To what extent is each of these fabric stories a classic or a fashion market?
- How versatile is the fibre? That is, how many fabric stories can it impact on and is it a good mixing fibre?
- What consumer benefits does the fibre bring (price, aesthetics, performance, overall value for money)?

#### BRANDING AND IMAGE

Branding has historically been applied at the trade level for materials and at the consumer level for finished products. Recently, a new type of branding has emerged, called component branding. 'Intel Inside' is probably the best-known example, but in the garment fabric industry Lycra, Tencel, Tactel, etc. have been promoted to consumers and labelled in garments in order to pull through demand. Natural fibres have a good consumer image which has been fostered and enhanced by generic branding and promotion such as the IWS Woolmark, Cotton Incorporated and Masters of Linen. Synthetic fibres (such as Crimplene, Dacron) were

### EXHIBIT 3

#### FIBRE CHARACTERISTICS— SUMMARY (example only)

FIBRE/FABRIC ASSESSMENT CRITERIA	Viscose	Cotton	Wool	Silk	Linen	Polyester Regular	Polyester Shin Gosen	New Fibre	Weights (%)
FUNDAMENTAL AESTHETIC	5	5	7	10	9	5	7	8	30
PERFORMANCE	3	4	5	3	4	7	8	5	10
PROCESSABILITY	5	6	4	4	3	5	3	6	20
VERSATILITY	4	6	4	3	3	6	6	3	5
IMAGE	4	7	7	8	8	4	6	8	30
Weighted Average	4.2	5.5	5.7	6.6	6.2	4.7	5.6	6.6	100

Scores: on a scale 1 = poor to 10 = excellent

**EXHIBIT 4**

IMPACT OF NEW FIBRE IN FIBRE BLENDS (example only)

Base Fabric/ Fibre	Fibre Added	I M P A C T O F F I B R E A D D I T I O N / B L E N D I N G					
		Dilute Expensive Fibre	Enginee Price in Middle Market	Improve Performance in Use	Improve Processability	Widen Finishing Options	Engineer Aesthetics/ Synergy Fibre
<b>Cotton</b>	<b>Modal</b>		X	✓			✓
<b>Polyester</b>	<b>Viscose</b>		X		X	✓	✓
<b>Wool</b>	<b>Viscose</b>		✓		X		✓
<b>Linen</b>	<b>Viscose</b>	✓✓		✓			X
<b>Cotton</b>	<b>Polyester</b>		✓	✓	X		
<b>Viscose</b>	<b>Polyester</b>		✓	✓✓	✓		X
<b>Polynosic</b>	<b>Polyester</b>		✓		✓		
<b>Polyester</b>	<b>Polynosic</b>		X			✓	✓
<b>Modal</b>	<b>Nylon</b>		✓	✓✓	X		X
<b>Cashmere</b>	<b>Wool</b>	✓✓					X

Key: ✓ = Benefit, ✓✓ = Major Benefit, X = Disadvantage, XX = Major Disadvantage

branded in the early days but eventually acquired a poor image due to poor attributes in garment form. Rayon, nylon and polyester all suffered from this. Nevertheless, fibres continue to be branded and promoted within the supply chain and, as noted above, some are now considered innovative enough to be promoted to consumers as high-quality components with their own labels and swing-tickets.

**CLASSIC, FASHION, FAD**

We have found in practice that it is very difficult to get reliable answers about the potential of new fibres from people involved in the supply chain since their minds are focused on the next season and its requirements for which any particular new fibre might not be suitable. An attempt has to be made to make respondents rise above their current concerns to consider the fundamentals. We have found the diagram in Exhibit 2 helpful in doing this. It shows that any new fibre, because of its novelty, will generate some sales, but it will not be possible

to determine until some future date whether demand will be significant and constant, or whether it will vary from time to time according to some fashion cycle. Discussions starting from this diagram enable the interviewer to tap into the fibre or fabric specifier's long experience over many years.

**CASE STUDIES**

It is instructive to examine some recent successes and failures in the introduction of new fibres.

**Microfibre Polyesters:** These fibres and yarns began to be commercialized in about 1985 and became established in the market by about 1990. They provided real benefits to consumers by allowing the cheap, mass-production of silk-like fabrics, performance outerwear fabrics and finer lingerie. They were there ready to be used when, in the early 1990s, there was an economic down-turn in many countries and both consumers and retailers turned away from fast-fashion, dominated largely by frequent colour changes, to more fundamental fabric

and garment innovation. Microfibres helped to provide the required innovation in terms of light and soft fabrics and interesting surface effects, such as peachskin. More compact fabric constructions gave some performance features, for use in rainwear, for example. Microfibres are now used extensively in both 100-per-cent and mixture form.

**DuPont's Tactel:** This is an updated nylon 6.6 filament fibre, originally created by ICI, on which much product development has been carried out to give it advantages over regular nylon in garments. It has been heavily branded and promoted and was launched initially into the performance sportswear and leisurewear market. Following success there, and the achievement of a high profile and a good image, it has been targeted at other clothing types and has been particularly successful in ladies' underwear.

**Courtaulds' Tencel:** This is basically a tougher form of staple viscose called lyocell (Lenzing also has a version) produced by a more environmentally

# SECTION TECHNIQUE TECHNICAL SECTION

## EXHIBIT 5

### ESTIMATION OF FUTURE DEMAND FOR A NEW OR MODIFIED FIBRE

Fabric Story	Estimated World Market Size (tpa)	Estimated Classic Fashion Split (%)	Estimated Current % Market Shares of Existing Fiber Types A-M					Estimated Potential Future % Market Shares of Fibre Types A-N					Potential Volume For New/Modified Fibre N (tpa)		
			A	B	...	L	M	A	B	...	L	M	N	Classic	Classic & Fashion
1	100,000	80/20	5	10	55	20	10	3	8	9	49	10	20	16,000	20,000
2															
3															
4															
•															
•															
•															
P															
<b>Total</b>														<b>127,000</b>	<b>200,000</b>

friendly process. It has the tendency to fibrillate, which gives the possibility of many new and interesting fabric handles and appearances. It can be used in many fabric stories and it is synergistic in many fabric mixtures. It was initially launched at a high price into top-end garment markets but it has now found a volume role, mainly in denim.

Production costs are expected to be well within many important price points as volume production develops so that the fibre has prospects for good long-term success. The excitement created by Tencel in the market combined with its shortage of supply has turned attention to some earlier higher performance viscose such as modal, polynosic and cupro. Many new fabric effects have been created from these by using more vigorous wet and dry finishing processes than previously.

**Cashgora:** This is a fine natural fibre with some but not all of the advantages of cashmere. It was launched on to the market at a slightly cheaper price than cashmere, aimed mainly at sweaters and scarves. Volume sales

failed to materialize, since consumers took the view that if they were going to pay a high price they would buy cashmere; otherwise they would buy a fine wool product. In effect, there is no consumer price point between fine lambswool and cashmere.

**Shin-gosen:** Design and production of these mainly polyester-based fibres has so far been driven largely by technologists. Many varieties now exist, but so far none of them have become big sellers. The problem is that each fibre has one, or only a small range of, end-uses. They are not versatile. The fibres are still made on the redundant-volume polyester plants in Japan, but the time is coming when investments in specially designed and dedicated production facilities will need to be made. But this will depend on whether a few fibre types which are versatile and have high volume potential can be identified. There are some major decisions which need to be made if technical ingenuity is to be transformed into market success.

### ASSESSING THE COMMERCIALITY OF NEW FIBRES

David Rigby Associates have developed methods of assessing the likely commercial success of a new or modified fibre which are based on the comments above. They are described in detail in the articles referred to at the end of the paper. Some important features of these methods are shown in Exhibits 3, 4 and 5. Exhibit 3 shows the results from questioning participants in the supply chain on the suitability of different fibres for a particular end-use. Exhibit 4 shows an assessment of the impact of a fibre added to another fibre to make a fibre blend for a particular end-use. Exhibit 5 shows, very schematically, how quantitative estimates are made of the likely future demand for a new fibre by aggregating the expected fashion and classic demand for the fibre, worldwide, in a number of fabric stories.

We have carried out a number of commercial assessment studies using these methods and the results have been used by our clients in decision-making in the following areas:

- Whether to invest in a plant to manufacture a new fibre, how big the plant should be and where it should be located.
- The retailers, garment types, fabric types and price points to be targeted.
- Fibre pricing policy and production cost targets.
- The desirable fibre properties to be targeted by further technical research and development work.
- The areas of focus and product targets for development programs for yarns, fabrics and finishes.
- The most promising countries in which to carry out collaborative product developments and the best spinners, weavers and finishers with which to work.
- Fibre branding policy.
- Targets, activities and budgets for fibre marketing, selling and promotion programs.

## CONCLUSION

Garment end-uses account for about 50 per cent of world textile fibre usage. There are many opportunities for fibre companies to help to provide the constant fabric innovation that the garment industry needs by developing and commercializing new and modified fibres. I wish the best of luck to any of you who take on this task. ♦

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